

Choosing an aphid partner: a matter of taste and smell

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Honeydew is the keystone upon which ants and aphids build their mutualistic relationship. We have investigated how sugar and volatile compounds from honeydew are involved in the discovery, the recognition and the exploitation of aphid colonies by the black garden ant *Lasius niger*. In addition to semiochemicals produced by aphids, honeydew volatile compounds are used by ant scouts to orient themselves and distantly recognize myrmecophilous species. Once discovered, aphid colonies producing sugars which are the most beneficial to the ants are preferentially tended. In this respect, the ways each sugar acts upon the feeding behavior of ant foragers and triggers the laying of a recruitment trail are essential to understand how their collective exploitation of aphid colonies proceeds and why mutualistic interactions between ants and aphids are maintained.

Sensitivity of ant scouts to honeydew sugars was also investigated. Dose-response curves revealed between-sugar differences with foragers being very sensitive even to small amounts of melezitose, a sugar specifically produced by aphid colonies. We discuss about the relevance of honeydew cues used by ants in the selection of sugary resources, the recognition of their honeydew-producing partners as well as in the assessment of size and nutritive value of exploited aphid colonies.

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